# System Overview

## BCM50 2.0

Business Communications Manager

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NORTEL

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# Chapter 1
# Getting started

## About this guide

This system overview gives a high-level understanding of the core capabilities and features of the Business Communications Manager 50. In addition, it indicates what capabilities and features are not supported with the BCM50.

## Audience

This overview is for installers, network administrators, and anyone else who is interested in the BCM50.

## Acronyms

Following is a list of acronyms used in this guide.

| Acronym | Description |
|---|---|
| ADID | Analog Direct Inward Dial |
| AMIS | Audio Messaging Interchange Specification |
| APAC | Asia Pacific |
| BCM | Business Communication Manager |
| BRI | ISDN Basic Rate Interface |
| CALA | Caribbean and Latin America |
| CC | Contact Center |
| CCR | Custom Call Routing |
| CDC | Compact Daughter Card |
| CDR | Call Detail Records |
| CIM | Common Information Model |
| CTI | Computer Telephony Integration |
| DMTF | Distributed Management Task Force |
| EU | European Union |
| FR | Frame Relay |
| FRU | Field Replacable Unit |

| Acronym | Description |
|---|---|
| GASI | Global Analog Station Interface |
| GASM | Global Analog Station Module |
| GATI | Global Analog Trunk Interface |
| GATM | Global Analog Trunk Module |
| GNPS | Global Network Product Support |
| GNTS | Global Enterprise Technical Support |
| ICCL | ISDN Call Connection Limit |
| IP | Internet Protocol |
| KEM | Key Expansion Module |
| LAN CTE | Local Area Network Computer Telephony Engine |
| MBM | Media Bay Module |
| MCDN | Meridian Customer Defined Network |
| MIB | Management Information Base |
| MWI | Message Waiting Indication |
| NCGL | Nortel Carrier Grade Linux |
| NCM | Network Configuration Manager |
| NCRI | Network Call Redirection Info |
| NRE | Non Recoverable Engineering |
| OA&M | Operations, Administration and Maintenance |
| OEM | Original Equipment Manufacturer |
| OS | Operating System |
| PPP | Point-to-Point Protocol |
| PSTN | Public Switched Telephone Network |
| PVQM | Proactive Voice Quality Monitoring |
| QoE | Quality of Experience |
| SFTP | Secure File Transfer Protocol |
| SHA1 | Secure Hashing Algorithm 1 |
| SIP | Session Initiated Protocol |
| SMB | Small and Medium Business |
| SME | Small and Medium Enterprise |
| SNMP | Simple Network Management Protocol |
| SRG | Survivable Remote Gateway |
| TAT | Trunk Anti-Tromboning |
| TDM | Time Division Multiplexing – as found in T1 / E1 trunks |
| TRO | Trunk Route Optimization |

| Acronym | Description |
|---|---|
| VoIP | Voice over Internet Protocol |
| VPIM | Voice Profile for Internet Mail |

# Related publications

This section provides a list of additional documents. To locate specific information, you can refer to the *Master Index of BCM50 Library*.

*Unified Messaging Configuration Guide* (NN40080-501)

*CallPilot Fax Set Up and Operation Guide* (NN40080-301)

*CallPilot Message Networking Set Up and Operation Guide* (NN40090-301)

*Personal Call Manager User Guide* (NN40020-103)

*Contact Center Set Up and Operation Guide* (NN40040-301)

*LAN CTE Configuration Guide* (NN40020-602)

*Call Detail Recording System Administration Guide* (NN40020-605)

# How to get help

This section explains how to get help for Nortel products and services.

## Getting Help from the Nortel Web site

The best way to get technical support for Nortel products is from the Nortel Technical Support Web site:

www.nortel.com/support

This site provides quick access to software, documentation, bulletins, and tools to address issues with Nortel products. More specifically, the site enables you to:

- download software, documentation, and product bulletins
- search the Technical Support Web site and the Nortel Knowledge Base for answers to technical issues
- sign up for automatic notification of new software and documentation for Nortel equipment
- open and manage technical support cases

## Getting Help over the phone from a Nortel Solutions Center

If you don't find the information you require on the Nortel Technical Support Web site, and have a Nortel support contract, you can also get help over the phone from a Nortel Solutions Center.

In North America, call 1-800-4NORTEL (1-800-466-7835).

Outside North America, go to the following Web site to obtain the phone number for your region:

www.nortel.com/callus

### Getting Help from a specialist by using an Express Routing Code

To access some Nortel Technical Solutions Centers, you can use an Express Routing Code (ERC) to quickly route your call to a specialist in your Nortel product or service. To locate the ERC for your product or service, go to:

www.nortel.com/erc

### Getting Help through a Nortel distributor or reseller

If you purchased a service contract for your Nortel product from a distributor or authorized reseller, contact the technical support staff for that distributor or reseller.

# Chapter 2
# System Overview

Business Communications Manager 50 (BCM50) 2.0 includes a software upgrade as well as new platform options with integrated Basic Rate Interface (BRI) trunks and new router hardware, which is introduced to meet the European Union (EU) requirement.

BCM50 achieves:

- BCM 4.0 feature equivalence for those clients requiring features rather then capacity
- Digital mobility features
- BCM50 expansion of the global reach for the platform

BCM50 also delivers an upgrade to Survivable Remote Gateway 50 (SRG50) that delivers expanded Survivable IP User support (32 to 80 users) and feature equivalence to SRG200/400.

BCM50 continues to be a complete, converged voice, data, and feature-rich business telephony applications solution for small business and small enterprise branch offices. BCM50 gives you the features and applications of traditional small office PBX and key systems plus the new converged value of IP.

In short, BCM50 delivers:

- BCM50 software upgrade from release 1.0 and release 1.0 EU
- BCM50 platforms
  - with and without new routers
  - with and without integrated BRI ports
- BRI port keycodes (supported in EMEA and APAC)
- New Analog DID MBMs: ADID4 & ADID8 (supported n North America, Taiwan and Hong Kong)
- New 8X16 MBM (supported in markets where GATM8 or DSM16 are sold)
- New router maintenance
- SRG50 2.0 keycodes and upgrade
- NCM 3.6 RP3 software

For more information, see "BCM50 new features" on page 20.

**Note:** In this document, BCM50 refers to the second release of BCM50. Where required, the following distinction between the BCM50 release versions is used:

- BCM50 1.0 is the first release of BCM50.
- BCM50 2.0 is the second release of BCM50.

# BCM50 hardware

BCM50 is available in six configurations:

- BCM50: The compact main unit, suitable for networks where integrated data-routing capability is not required or networks that already have an IP network.
- BCM50a: Includes an ADSL router and an extra expansion port.
- BCM50e: Includes an integrated Ethernet router and an extra expansion port.
- BCM50b: Includes an integrated Dual ISDN S/T BRI.
- BCM50be: Includes an Ethernet router and a Dual ISDN S/T BRI.
- BCM50ba: Includes ADSL router and a Dual ISDN S/T BRI.

For more information about the integrated routers, see "BCM50e and BCM50a: BCM systems with integrated routers" on page 13 or "BCM50b, BCM50ba, and BCM50be: BCM systems with integrated BRIs" on page 16.

For more information about BCM50 hardware, see the *BCM50 Installation and Maintenance Guide*.

## BCM50 main unit

The BCM50 main unit (with telephony only) provides call processing and simple data-networking functions. It provides connections for 12 digital telephones, four (PSTN) lines, four analog station ports, and 4 connections for auxiliary equipment (auxiliary ringer, page relay, page output, and music source). The BCM50 main unit does not have a router, but it does have four LAN ports: one is the OAM port for technicians, and the other three are for basic LAN connectivity.

A main unit contains the following field-replaceable units:

- 1 programmed hard disk
- 1 cooling fan
- 1 router card (BCM50a and BCM50e only)

## Additional BCM50 hardware

The BCM50 expansion unit is a compact unit that accommodates the Media Bay Modules used by other BCM platforms. The BCM50 main unit can support a maximum of two expansion units. See "BCM50 expansion unit and media bay modules" on page 18 for more information.

The wallmount bracket is an inexpensive bracket designed for mounting the BCM50 or expansion unit to a wall, see "Mounting kits" on page 19 for more information. An optional wiring card which provides RJ-45 connectors for all main unit trunk and station interfaces is also available for use with the wallmount bracket.

The rackmount shelf is an inexpensive shelf designed for mounting a maximum of four BCM50 systems into a standard 19-inch rack. See "Mounting kits" on page 19 for more information. An optional patch field that provides RJ-45 connectors for all main unit trunk and station interfaces is also available.

BCM50 supports the complete range of IP telephony capability offered by existing BCM products. These features are enabled through the use of keycodes and require no additional hardware:

- VoIP Gateway (H.323): up to 60 VoIP trunks
- VoIP Telephony Clients: up to 32 VoIP Telephony clients, supporting the complete range of Nortel IP phones
- SIP trunks

## BCM50 physical dimensions

BCM50 has a compact plastic enclosure that is designed so that you do not need to add additional hardware to enable features and applications. The compact size and flexible installation options support fast installations and accommodate the diverse environmental and physical conditions of small businesses.

The following table describes the physical dimensions of the BCM50 main unit and expansion unit.

| Dimensions | BCM50 main unit | BCM50 expansion unit |
|---|---|---|
| **Height** | 2" (5.1 cm) | 2" (5.1 cm) |
| **Width** | 8.5" (21.6 cm) | 8.5" (21.6 cm) |
| **Depth** | 12.5" (31.8 cm) | 12.5" (31.8 cm) |

The BCM50 main unit and expansion unit design features include:

- external power supply
- stackable units
- rubber feet which allow the unit installation on desktop or shelf
- optional wallmount bracket
- optional rackmount shelf

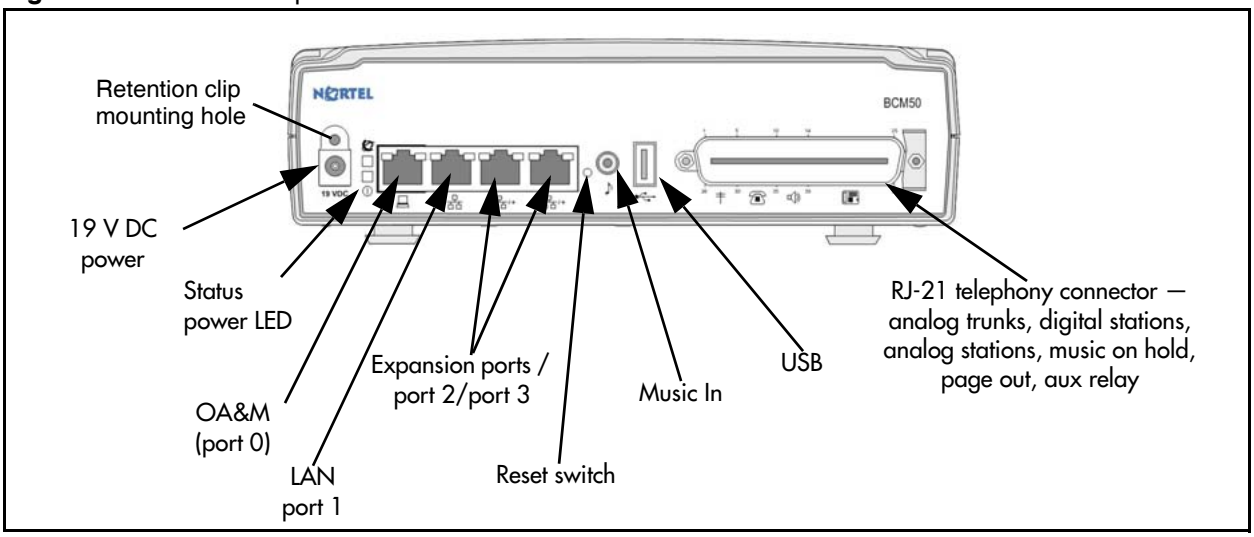
## BCM50 physical interfaces

The BCM50 interfaces are designed so that you do not need additional hardware. See Figure 1 for a graphical representation of the BCM50 interfaces.
Your BCM50 comes with these interfaces:

- Twelve digital station ports that support the complete line of Business Series Telephones. These ports are accessible through the front pane RJ-21 connector and are enabled through keycodes.
- Four Analog Loop Supervised Trunks. These ports are accessible through the front panel RJ-21 connector and are enabled through keycodes.
- Four Analog Station interfaces with message waiting and CLID support. These ports are accessible through the front panel RJ-21 connector are enabled through keycodes.
- Page and auxiliary relay output on the front panel RJ-21 connector.
- Three-port 10/100 Ethernet switch with auto sensing and auto polarity. Two of these ports also support connecting optional expansion units.
- One 10/100 Ethernet port reserved for direct access management of the system.
- Music on hold input supported either through front panel jack or RJ-21 connector.
- USB port to enhance BCM50 management.

You can extend the capacity of your system by using the optional "BCM50 expansion unit and media bay modules" on page 18.

**Figure 1** BCM50 Front panel and interfaces




## Telephony features

BCM50 comes with a full set of telephony features that can respond to the varied requirements of your business. BCM50 supports:

- the base telephony features currently provided in BCM 4.0
- Business Series Telephones including Doorphone
- analog station terminals, including phones and fax machines

## IP telephony features

BCM50 offers the complete range of IP telephony features currently provided in the Business Communications Manager product line:

- G.711 and G.729 codecs
- echo cancellation
- H.323 IP trunking and MCDN over H.323
- SIP and SIP proxy
- MCDN SIP trunking
- Gatekeeper
- T.38 Fax

**Note:** Support for desktop clients includes Nortel IP telephone portfolio including i2001, i2002, and i2004 desktop sets, and i2050 Software Phones that extend voice services to mobile and home-based employees over the Internet. Set support includes 1120e, 1140e, 2033 and 2007.

# BCM50e and BCM50a: BCM systems with integrated routers

BCM50 is available with an optional integrated ADSL or Ethernet router. These units suit the needs of small businesses and small enterprise branch offices that require external data networking, such as Internet access or VPN-based networking to other offices.

Two variations of the BCM50 have an integrated router, depending on the WAN interface you require. The two variations are the BCM50e (Ethernet WAN) and BCM50a (ADSL WAN). Both routers have these data features:

- secure Internet access
- multi-site VoIP trunking using secure VPN tunnels
- wide-area VoIP applications with remote user support
- remote IP management and support using VPN clients

## Common features and capabilities

BCM50a and BCM50e share the same robust set of functionality focused on secure Internet access and VoIP.

BCM50e and BCM50a have three additional ports of Ethernet LAN for a total of six LAN ports for local premises use. All Ethernet ports are 10/100 Mbps autosensing and support autopolarity. Therefore, no crossover cable is required to connect data hardware to the unit. An additional port is provided for WAN access, either Ethernet or ADSL, depending on the model.

The following features make BCM50a and BCM50e attractive for small sites that want to become Internet-capable and multi-site enterprises with many small sites. Until now, however, these sites could not be part of the corporate WAN because of the high cost of traditional WAN connectivity and managed service.

**VPN**

- 10 IPSec Branch Office Tunnels (peer-to-peer)
- IPSEC client termination supported
- support for bandwidth management
- support for Dynamically addressed peers – ABOT
- support for Client Tunnel origination (not termination) to simplify the connection to a larger VPN Router network
- IKEv1 Main Mode
- IKEv1 Quick Mode
- Diffie-Hellman Group 1,2
- IPSec Tunnel Mode
- ESP
- NAT Traversal

**NAT**

- many-to-one, static, many-to-many
- port forwarding
- IPSec Pass through
- NAT support for tunnel mode IPSec tunnels
- Throughput traffic performance - 23.1 Mbps

**IP Services**

- DHCP client
- DHCP server with support for Nortel Internet Telephones
- DHCP Relay supported
- DNS Proxy
- DNS with VPN client
- WAN failover supported
- PPPoE
- PPTP (ethernet router only)
- Configurable MAC address
- Clear text traffic:
  - — WAN to LAN 33.9 Mbps
  - — LAN to WAN 30.5 Mbps

**Security Services**

- cryptographic services
- DES and 3DES
- data authentication SHA-1
- data authentication MD-5
- authentication services
- pre-shared secrets
- security services
- stateful firewall
- intrusion detection
- AES support
- digital certificates supported
- RADIUS support

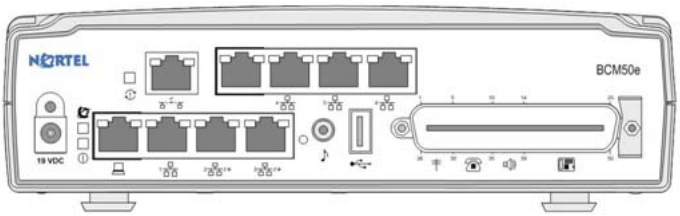
**Router**

- Clear text routing
- Static – through tunnel
- RIP v1 – through tunnel and clear text
- RIP v2 – through tunnel and clear text

## BCM50e

The BCM50e in Figure 2 provides call processing and data-routing features and is suitable for networks that require datarouting capability using an integrated Ethernet router. The WAN interface port provides 10/100 Ethernet with autosensing and autopolarity. If you have existing or alternative WAN access technology, you can still benefit from the VoIP features of the BCM50.

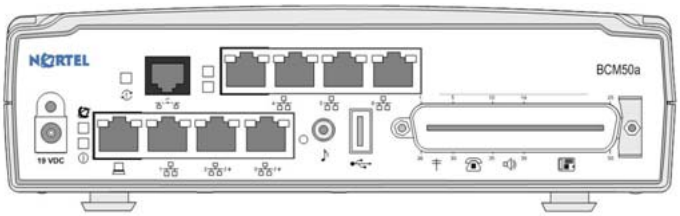
**Figure 2** BCM50e front panel




## BCM50a

The BCM50a in Figure 3 provides call processing, data routing features, and an integrated ADSL modem. The BCM50a is a stand-alone set of integrated applications. With the BCM50a, you have complete voice and Internet service with resulting efficiency and convenience.

**Figure 3** BCM50a front panel




These features provide a complete, integrated Communications Server/ADSL access package for ease of interconnecting with service-provider ADSL networks:

- ITU G.992.1 (G.DMT)
- G.992.1 Annex A
- ITU G.992.2 (G.Lite)
- ANSI T1.413 Issue 2
- DSL Forum document TR-042 ATM Transport over ADSL
- G.hs 994.1
- G.ploam G.997.1
- Autonegotiation rate adaptation
- RFC 2364 PPP over AAL5
- RFC 2684 Multiprotocol Encapsulation over ATM, both Bridged and Routed encapsulation
- Support for British Telecom SIN 329
- Broadband IP Products requirements for End User NTE equipment, where the router and ADSL modem functions are integrated into one device

- RFC 1483 Multi-protocol over AAL5
- RFC 2365 PPP over AAL5
- RFC 2516 PPPoE
- Traffic-shaping UBR, CBR
- ATM forum UNI 3.1/4.0 PVC (minimum 5 PVCs)

# BCM50b, BCM50ba, and BCM50be: BCM systems with integrated BRIs

The BCM50 system provides private network and telephony-management capability to small and medium-sized businesses the EMEA and APAC markets. The BCM50 integrates voice and data capabilities, IP telephony gateway functions, and data-routing features into a single telephony system. The BCM50 is a compact system that you use to create and provide telephony applications for use in a business environment.

## Common features and capabilities

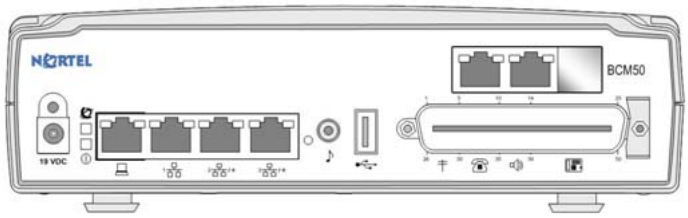
- BRI Compact Daughter Card (CDC)— Performance conforms to ITU I.430, ETSI ETS 300012, ANSI T1.605, and safety standards and lightening protection
- Additional CDC connector, for a total of two CDC slots
- Xilinx FPGA - XC3S400-4FT256C
- Integrated 8-port 10/100 Ethernet switch to support future eDSP CDC (upgraded from 5-port)
- RoHS EU compliance
- 2.5” hard drive and new bracket
- Optimized position of fan cable, SATA cable, and hard-drive connector
- POL Current Limiting
- Introduce BRI and improve pack performance, and customer feature set.
- Memory parity
- Upgrade DSP and microprocessor
- GASI support

## BCM50b

The BCM50b main unit provides similar functionality to the BCM50 main unit. The difference is that the BCM50b main unit has two integrated BRI ports replacing the four analog lines on the RJ-21 telephony connector.

- new CSC with integrated BRI in place of integrated GATI
- keycode BRI ports

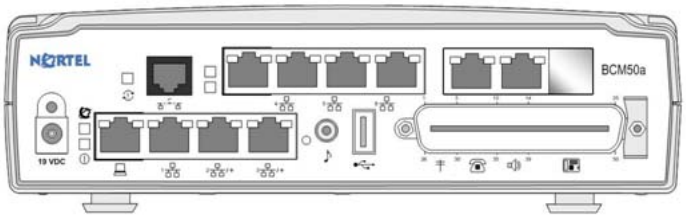
**Figure 4** BCM50b Front panel




## BCM50ba

The BCM50ba main unit provides similar functionality to the BCM50a main unit. The difference is that the BCM50ba main unit has two integrated BRI ports replacing the four analog lines on the RJ-21 telephony connector.

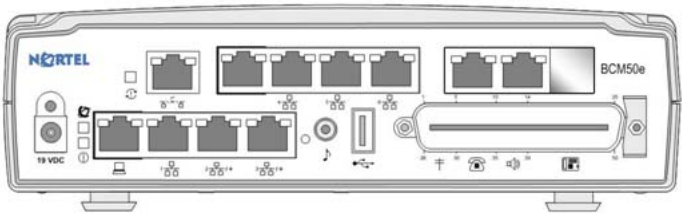
**Figure 5** BCM50ba Front panel




## BCM50be

The BCM50be main unit provides similar functionality to the BCM50e main unit. The difference is that the BCM50be main unit has two integrated BRI ports replacing the four analog lines on the RJ-21 telephony connector.

**Figure 6** BCM50be Front panel



# BCM50 expansion unit and media bay modules

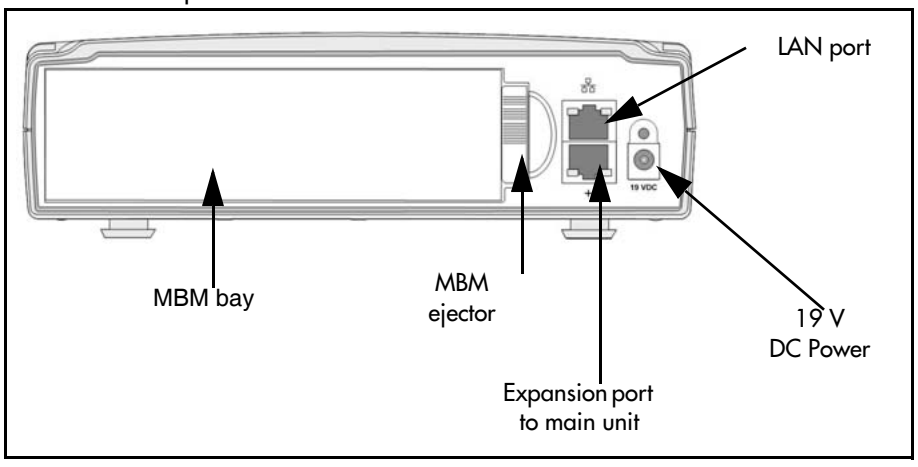
You can expand BCM50 trunk and station capacity by connecting up to two external BCM50 expansion units. Expansion ports on the BCM50 are enabled through keycodes.

The expansion unit fits easily with the BCM50 and is easy to integrate and install using the wallmount and rackmount accessories. The expansion unit is connected to the BCM50 using an RJ-45 CAT5 cable and uses its own external power supply, both of which are provided with the expansion unit.

Each expansion unit is capable of supporting one Media Bay Module (MBM), the same products that are used in the other products of the BCM product portfolio. BCM50 supports these Media Bay Modules:

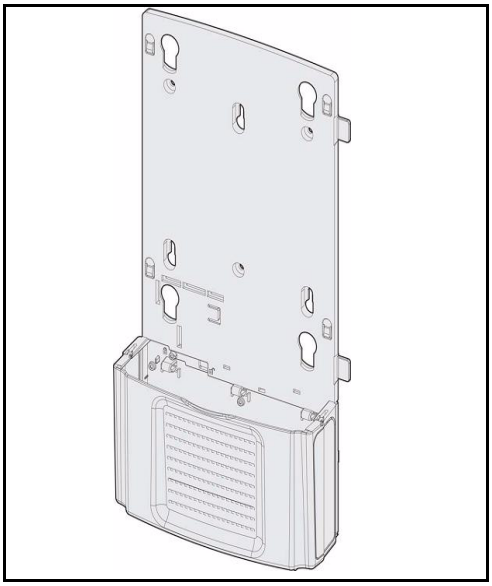
- 4x16 Combo (4 analog trunks, 16 digital stations) — North America only
- 8x16 combo (8 analog trunks, 16 digital stations)
- ADID4 and ADID8 modules — North America only
- ASM8+ (8-port analog station interface) — North America only
- CTM4 (4-port CLID trunk module) — North America only
- CTM8 (8-port CLID trunk module) — North America only
- DTM (digital trunk module)
- BRI (ISDN Basic Rate trunk module)
- DSM16+ (16-port digital station module)
- DSM32+ (32-port digital station module)
- GATM4 (4-port global analog trunk module)
- GATM8 (8-port global analog trunk module)
- GASM8 (8-port global analog station module)

**Figure 7** BCM50 Expansion unit



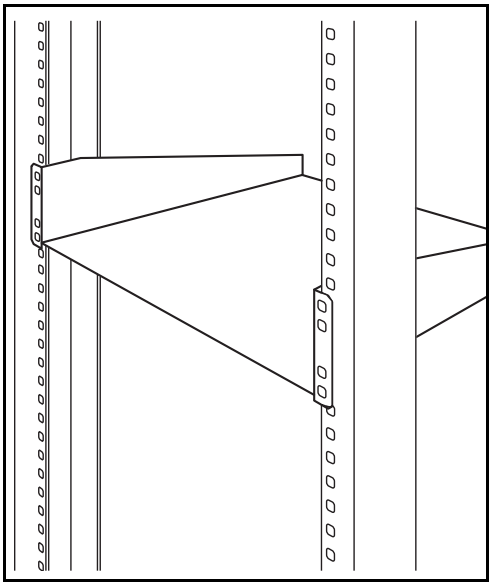
# Mounting kits

Businesses can have a range of physical environments in which the system must be installed. The BCM50 has optional accessories you can use to tailor the installation to the needs of the location.



**Small System Wallmount Bracket**

You can use this optional bracket to mount the BCM50 and expansion unit to a vertical surface. You attach the bracket to the surface and hang the BCM50 from the bracket. The details on the bracket ensure that the BCM50 securely locks into place.
The lower part of the bracket includes a covered cable tray, allowing for organized management of cables. An optional add-in card that mounts into the cable tray is available, providing RJ-45 connections for the main unit trunk and station interfaces.



**Small System Rackmount Shelf**

You can install this optional shelf in a standard 19-inch rack and mount the BCM50 and expansion unit on it. The details on the shelf firmly lock the BCM50 in place. The bracket also provides space to store power supplies for the BCM50. An optional patch panel is available to provide RJ-45 connections for the main unit trunk and station interfaces.

# BCM50 new features

The following table represents the content matrix for BCM50. This matrix indicates where BCM50 aligns with BCM 4.0 and new features specific to BCM50.

| | Aligned with BCM 4.0 | BCM50 New Features |
|---|---|---|
| **Core Telephony** | • Digital Mobility<br>• Doorphone<br>• Ad Hoc Conferencing<br>• New Zealand, Mexico, Poland profile updates<br>• GASM Poland and Australia CLID | • GATx (Bahrain, Ireland, Hong Kong, and Peoples Republic of China)<br>• GATI profiles (United Kingdom, Poland, Mexico, Taiwan, Brazil, Australia, and New Zealand)<br>• Modem answer on CLID feature |
| **IP Telephony** | • WLAN IP sets<br>• IP 2007 set<br>• IP 2033 set<br>• IP 2050<br>• IP KEM<br>• IP 1120E<br>• IP 1140E<br>• SIP trunk features<br>• H323 Interop (SN08, SN09, SE09)<br>• SIP/H323 Interop (CS1K 4/4.5, MCS5100 3 and 3.5) | • IP 1100<br>• IP Set Firmware<br>• SIP/H323 Interop (BCM 4.0 and BCM 3.7) |
| **Management** | • PVQM<br>• Citrix of Element Manager | • Remote and Scheduled Upgrade<br>• NCM Support<br>• ISDN Dial-up |
| **Data and Security** | • Security | • WAN Failover<br>• EU routers with Contivity v2.5 and VPN Client Termination |
| **Applications** | • Contact Center<br>• Reporting Contact Center<br>• IP MOH<br>• MCDN TAT<br>• MMCC<br>• Hospitality | |
| **Platform** | | • BRI Versions<br>— BCM50b<br>— BCM50ba<br>— BCM50be<br>• BCM50 1.0 Upgrade CD<br>• SRG50 Support<br>• 8x16 MBM<br>• ADID MBM (North America only) |

## BRI version

BCM50 integrates 2-port BRI S/T trunks for EMEA and Asia Pacific (APAC) markets to give this option to customers who need digital trunking. The analog trunk versions will still be available separately for those customers who require them.

## R2MFC MBM support

BCM50 supports the R2MFC MBM in selected Caribbean and Latin America (CALA) and APAC countries. See the country matrix in "The I24 KEM is ideal for Secretary and Health care. Global markets" on page 29.

## EU compliant routers M222/252 firmware

BCM50 routers deliver Removal of Hazardous Substances (RoHS) compliancy for network infrastructure, or 5/6 compliancy. This requires new hardware for both the Ethernet router and the ADSL router. The new hardware is based on a common architecture for both routers and is also common to Contivity EU releases.

These new features apply to the M222/252 routers only. A software upgrade will be available for installed M221/251. The following features align to Contivity 2.5 with the addition of VPN client termination support.

- VPN Client Termination (new)
- Port Restricted Cone NAT
- SIP firewall ALG
- Nailed Up tunnels
- SSH, SSL and Secure FTP
- New hardware support for ADSL2+
- Client emulation enhancements
- Client management privileges
- Failover IP assignment for automatic assignment of fail over site IP address
- X.509 digital certificates
- New DSL version support for ADSL2+

**Note:** M221/251 refers to the routers shipped with BCM50 1.0 units, and M222/252 refers to the new EU-compliant routers shipping on EU BCM50 1.0 and BCM50 2.0 units.

## WAN failover

The new router hardware simplifies WAN failover as well as future management integration through the internal serial connector. The new router also allows support for WAN failover on all BCM50 platforms with M222/252 routers.

WAN failover allows calls that experience issues using the WAN link to continue over the soft modem or LAN or ISDN.

## Software upgrade

The target time for an upgrade from BCM50 1.0 is 45 minutes. The upgrade with BCM50 and Element Manager supports remote and scheduled upgrades. This new capacity is significant for partners and administrators to save on installation costs and business impacts.

## SRG50

BCM50 1.0 required a patch and a keycode upgrade for SRG50. BCM50 2.0 eliminates this patch for SRG50.

The SRG50 functionality for BCM50:

- supports the BCM50b model
- supports SRG keycode without an interim patch
- expands survivable IP clients to 80
- supports SIP trunking
- expands IP client support to include:
  - 2033 IP Conference Phone
  - IP KEM
  - Next Generation 1100 Series phones (IP Phone 1140E, IP Phone 1120E)
  - WLAN 2212 Support
  - 2050 Soft Phone
  - MVC 2050

## ISDN BRI dial-up support

The BCM50 requires a data layer over the channelized ISDN for remote management dial-up over BRI. Remote management over BRI is supported both over the integrated BRI CDC or BRI MBM configured for ISDN support. All on-demand and scheduled management tasks, are such as CDR collection, backup and restore, software updates, and log collection, are supported.

## NCM support for BCM50

NCM support for BCM50 is delivered as a cartridge release similar to BCM50 1.0 and BCM 4.0. The product is branded NCM 3.6 Release Pack 3 (NCM 3.6 RP3) and is delivered to new customers through a new CD that includes both the NCM 3.6 server and the NCM 3.6 RP3 cartridge software. The server level remains at 3.6. See “Network Configuration Manager (NCM)” on page 37 for more information.

## GATI localization

GATI supports EMEA, China, and APAC countries where the MBM is currently sold. See the country matrix in "The I24 KEM is ideal for Secretary and Health care. Global markets" on page 29. Some profiles require new Disconnect Supervision (DS) or Caller ID (CLID) support as outlined in the country matrix.

## Analog Direct Inward Dial (ADID) MBM

BCM50 adds ADID MBMs (ADID4 and ADID8) for North America, Taiwan, and Hong Kong markets. This MBM is backward-compatible to BCM 4.0.

## 8x16 MBM

BCM50 adds an 8x16 Combo MBM to deliver GATM8 plus DSM16 capability in one MBM. It requires only one expansion chassis and is supported in all markets where the GATM8 or DSM16 is sold. This MBM is backward-compatible to BCM4.0.

## Next generation IP phones

BCM50 supports Next Generation IP phones from BCM4.0. PVQM, Desktop Assistant, and Business Element Manager button programming includes support for both existing sets and new sets.

## SIP/H.323 interoperability

BCM50 and SRG50 match BCM 4.0 interoperability with other servers plus BCM 4.0 and BCM 3.7.

SIP/H.323 interoperability includes:

- CS1000 4 and 4.5
- MCS5100 3 and 3.5

H.323 interoperability includes:

- CS2000 SN08 and SN09
- CS2100 SE09

## Hardware inventory

As part of the BCM50 management changes, the Business Element Manager hardware inventory panel and the Entity MIB allow remote viewing of detailed information about the CSC, integrated router, and integrated BRI CDC hardware. See the content matrix in "BCM50 new features" on page 20 for more information. Additionally, visibility of other FRU components such as fans is added to provide a complete hardware inventory view of all BCM50 hardware components to the FRU level.

# BCM50 capabilities aligned with BCM 4.0

In addition to the new features introduced with BCM50, it incorporates many features that were introduced with BCM 4.0. These include:


- "Proactive Voice Quality Monitoring"
- “Ad-Hoc conferencing” on page 25
- “Meridian Customer Defined Network (MCDN) Trunk Anti-Tromboning (TAT) with integrated applications” on page 25
- “Session Initiated Protocol (SIP) enhancements” on page 25
- “Security enhancements” on page 26
- “Terminal and mobility support” on page 28


## Proactive Voice Quality Monitoring

The PVQM capability provides the ability to set call-quality thresholds for IP sets receive an alert and if these thresholds are violated. This provides the ability to proactively identify voice quality of experience (QoE) issues on a per-call basis. This, in turn, enables troubleshooting of voice-quality issues within the network.

PVQM supports calls from an IP set to any other set or trunk. The solution is optimized with Phase 2 IP sets, which support autonotification.

Measured call-quality metrics include:

- packet loss
- inter-arrival jitter
- listening R-value
- RTCP round trip delay

Listener "R" value is a direct measure of the call quality or transmission quality, incorporating the effects of CODEC type, packet loss, discard, burstiness, delay, and other relevant voice-quality metrics.

With PVQM, a system-wide summary view of threshold-violation alert occurrences is maintained. Threshold violations can be sent as alarms and used by the centralized AppManager VoIP performance-monitoring product from NetIQ to generate a system-wide view of the voice quality of the network and help diagnose voice-quality issues. The alarms include extensive call-quality information in accordance with IETF RTCP-XR RFC 3611.

PVQM on BCM50:

- provides the ability to monitor quality and integrity of IP-based voice networking
- ia a a significant differentiator in VoIP convergence network sales with its market-leading, proactive, per-call focus
- mitigates customer issues over whether the data network or the BCM is at fault when call-quality issues situations occur
- provides consistency in QoE solution across Nortel enterprise call servers to facilitate mixed network deployments

## Ad-Hoc conferencing

Currently, the BCM supports three-party conferencing. Ad-Hoc Conferencing extends this capability to support large multi-party conferencing.

Ad-Hoc conferencing delivers:

- A user interface model which is similar to today's F3 conference.
- No impact on the user's feature-button footprint occurs (that is, there is no need for additional IC keys or an additional feature key is not necessary).
- The current three-party conferencing capabilities, allowing users the flexibility to have larger multi-party conferences.
- Support up to 18 simultaneous ad-hoc participants on multiple conferences.

## Meridian Customer Defined Network (MCDN) Trunk Anti-Tromboning (TAT) with integrated applications

The BCM currently uses MCDN signaling to optimize network-resource utilization when transferring or forwarding station-to-station calls. This feature adds the ability for applications such as Voicemail and AutoAttendant to leverage MCDN capabilities to optimize network utilization.

MCDN TAT on BCM50:

- provides customers with optimal utilization of trunk facilities
- enables a greater number of feasible networking scenarios for servicing customers

MCDN TAT allows the BCM to determine if calls routed across a network by the integrated AutoAttendant or Voicemail should invoke the TAT or Trunk Route Optimization (TRO) MCDN functionality to optimize the trunking network connection.

## Session Initiated Protocol (SIP) enhancements

BCM supports H.323 and SIP VoIP basic call communication for BCM-to-BCM calls. H.323 also supports the same features that the MCDN (Meridian Customer Defined Network) capability supports. This SIP enhancement adds the following features to the BCM SIP capability:

- Support for the MCDN features with SIP
- Expanded SIP interoperability to the CS1K and MCS5100

The MCDN supported features include:

- Private Name/Number
- Network Call Redirection Info (NCRI)
- Trunk Anti-Tromboning (TAT)
- ISDN Call Connection Limit (ICCL)
- Message Waiting Indication (MWI)
- Trunk Route Optimization (TRO)

In enterprise network systems, the SIP feature provides the ability to support private numbering plans, optimizes the use of network traffic (TAT/TRO/ICCL), and provides support for centralized voice mail applications (NCRI, MWI) using the SIP messaging protocol. By making these capabilities available using the SIP protocol, you can begin to transition your network to the latest standard.

## Security enhancements

The following sections describe the security enhancements with BCM50 2.0:


- "User account access management" on page 26
- "Secure interface and audit logging" on page 27


### User account access management

This feature significantly improves BCM user-account access management by enhancing password, session and account authentication, and access-management enhancements. These improvements bring the BCM in alignment with the security enhancements being introduced with BCM50 and add incremental capabilities.

Password Management and Policy Enhancements include:

- Minimize the vulnerability of passwords
  - Password characteristics are now more stringent (length, criteria)
  - Password aging, history and change notification added
  - Forced password change on initial login
  - Password storage hashing with Secure Hashing Algorithm 1 (SHA1)

Session Management Enhancements minimizes the vulnerability of logged-in sessions for idle session time-outs.

Account Management includes:

- Minimize the vulnerability of User IDs
  - Automatic disabling of unused accounts
  - Set-based admin requires user ID and password

Account User ID Access Privilege Management includes the logged-in user ID session/access display.

These enhancements to user-account access management provide a secure BCM access environment, making it difficult for a malicious user to gain access to a BCM. Also, they allow owners of BCM to enforce secure account-access controls to the BCM to ensure secure BCM management and increase protection against potential vulnerabilities.

## Secure interface and audit logging

This feature enhances interface security by adding more secure access controls. It also adds security audit logs, allowing capture of configuration changes and system activity by User ID, date, and time. These improvements bring the BCM in alignment with the security enhancements being introduced with BCM50.

Secure Interface Access and Communications Controls provide:

- Support for Secure Copy (SFTP), providing for SSH encrypted file transfers
- Support for Simple Network Management Protocol (SNMP) v2 & v3, including encryption provided with v3
- BCM owner control of Nortel technical support access
- Use of digital signatures and enhanced tamper detection to ensure trusted sources for software upgrades (patches and software release upgrades)
- Ability to test the system ability to generate alarms and logs, including system security alarms and logs

Audit log tracks critical changes to the system and the login attempts. The log includes:

- Last successful login identification and interface
- Last failed login attempt, total failed logins since last successful login
- Configuration change log, tracking configuration changes to system by User ID
- RADIUS Support (Centralized Authentication and Radius Client to authenticate and authorize using a centralized Radius server)

In addition to supporting IPsec tunnels for management, the ability to encrypt SNMP and file transfers provides BCM users an expanded capability set for secure interface communications.

Audit logging of login attempts provides the BCM user the ability to track security violation attempts and determine if further action is required.

If a user ID security breach is suspected as a result of system configuration changes, the audit logging of configuration changes provides traceability to user IDs and interfaces.

Audit logging provides an increased ease of use and a reduction in user lost productivity by ensuring system availability (protection against DoS attacks). Administrative and support overheads and lower OPEX expenses (RADIUS, User Account, Password, Session by management of Security Policies) are reduced.

There is an overall increase in Security with effective logging capabilities for Audit Trail logs, Alarm logs, Configuration Change logs.

A BCM user who requires improved interface access and communications security for alarm, log, and file transfers can use these security enhancements. As well, a user can audit and identify the critical system changes specific users initiate.

## Terminal and mobility support

The BCM50 Terminal and mobility support is equivalent to that of BCM 4.0. The new sets supported by BCM50 include:

- IP Phone 1120e
- IP Phone 1140e
- IP Phone 2007
- "IP audio conference phone 2033" on page 28
- "IP Key Expansion Module I24" on page 29

The IP phones incorporate network management and security enhancements. The firmware can be upgraded with a patch or call sever release providing:

- enhanced VLAN (configured manually or with DHCP) and PC VLAN (configured manually) tagging
- enhanced display for local Network Diagnostic Utilities

**Note:** For additional terminal and mobility supported devices, see the "BCM compatibility matrix" on page 45.

### IP audio conference phone 2033

The IP audio conference phone 2033 expands the IP portfolio to conference rooms and delivers high-quality audio.

#### IP Audio Conference Phone 2033

- Familiar Nortel user interface, emulates IP Phone 2001
- Well-known Polycom design, acoustics
- Nortel branded, sold, supported
- Full-duplex handsfree with 360° room coverage
- Expandable using extension microphones
- Local AC power option
- Color: Charcoal
- Icons for global market
- Future safe investment (enhancement through firmware download)

The IP audio conference phone 2033:

- is ideal for conference rooms and executive offices
- fosters collaboration and idea exchange

## IP Key Expansion Module I24

The I24 Key Expansion Module (KEM) expands the IP portfolio by providing more line and feature appearances for IP sets.

### I24 KEM

- Hardware module to expand line/feature buttons
- Self-label display to customize desktop
- Key labelling based on the feature that is programmed on that key
- Connects through accessory port on IP 2002 or IP 2004 phones
- Powered by host phone through an accessory port
- BCM supports up to 5 KEMs per IP phone
- Maximum 20 sets per system with KEM

The I24 KEM is ideal for Secretary and Health care. Global markets

BCM50 voice prompts, which were introduced in BCM 4.0, include Polish, Finnish, Korean, Turkish, and Czech.

The following additional capabilities are available:

- addition of second dial tone for PRI/BRI
  - — In some markets, a PBX must provide a local tone to the originating party (as opposed to the central office).
  - — This feature adds the ability to provide the local tone.
- increased public received digit length from 7 to 12 digits
  - — Some markets require more than public received digits to support dial plans.

BCM50 1.0 regional bundles for APAC and EMEA are updated to include the GATI or BRI keycodes in place of expansion chassis and BRI MBM where applicable.

SRG50 Global Bundles are maintained and updated. SRG50 2.0 leverages any geographic localization enhancements of BCM50.

Localization is a key goal for BCM50. Onboard Analog and BRI trunk profiles are localized to new markets to offer an integrated solution without dependency on external MBMs for smaller sites. This solution offers simplicity in installation, improved margins, and a competitive offer in global regions.

The following table reflects new analog, BRI, and country support that is added in BCM50.

| | Trunks | | | MBM | |
|---|---|---|---|---|---|
| **Region** | **GATM** | **GATI** | **BRI** | **R2MF** | **DID** |
| N. America | | | | | Yes |
| **EMEA** | | | | | |
| UK | | Yes | Yes | | |
| Poland | | Yes | Yes | | |
| Bahrain | DS | Yes | Yes | | |
| Saudi | | | Yes | | |
| UAE | | | Yes | | |
| Qatar | | | Yes | | |
| Ireland | DS/CLI | Yes | Yes | | |
| South Africa | | | Yes | | |
| Spain | | | Yes | | |
| France | | | Yes | | |
| Russian Fed | | | Yes | | |
| Turkey | | | Yes | | |
| Greece | | | Yes | | |
| Egypt | | | Yes | | |
| Kuwait | | | Yes | | |
| Switzerland | | | Yes | | |
| Sweden | | | Yes | | |
| Norway | | | Yes | | |
| Netherlands | | | Yes | | |
| Italy | | | Yes | | |
| Germany | | | Yes | | |
| Denmark | | | Yes | | |
| Belgium | | | Yes | | |
| Austria | | | Yes | | |
| **CALA** | | | | | |
| Caribbean | | | | | Yes |
| Mexico | | DS | | Yes | |
| Brazil | | Yes | | Yes | |
| Chile | | | | Yes | |
| Argentina | | | | Yes | |
| Colombia | | | | Yes | |

| | Trunks | | | MBM | |
|---|---|---|---|---|---|
| **Region** | **GATM** | **GATI** | **BRI** | **R2MF** | **DID** |
| Venezuela | | | | Yes | |
| **GC** | | | | | |
| Hong Kong | DS/CLI | DS/CLI | | | |
| PRC | DS/CLI | DS/CLI | | | |
| Taiwan | | DS/CLI | | | Yes |
| **APAC** | | | | | |
| Australia | | Yes | Yes | | |
| New Zealand | | | Yes | | |
| Korea | | same as BCM50 1.0 | Yes | | |
| India | | same as BCM50 1.0 | Yes | | |

# Support, security and servicing

BCM50 provides solutions for client support, replacement parts, upgrades and enhanced servicing.

## Client operating system support

BCM50 supports Windows 2000 Professional, Windows XP Professional, Citrix Metaframe XP for Element Manager, and Citrix client support equivalent to BCM 4.0.

## Field replaceable units (FRU)

FRU strategy is consistent with BCM50 1.0, including replacement router and new BRI CDC card. CDCs are not hot-pluggable.

## Field upgrades

The BCM50 upgrade kit is available. Element Manager and NCM support remote and scheduled upgrades from BCM50 1.0, not including router upgrade support.

## Servicing

Serviceability enhancements in BCM50 include:

- BRI CDC offered as a FRU

- Reduced dependency on dip switches for Media Bay Modules as global profiles are downloadable

# BCM50 management

You can quickly and easily install, configure, and administer BCM50. These topics summarize the BCM50 management areas:

- "Ease of installation"
- “Remote management accessibility” on page 33
- “On-box and device manageability features” on page 33
- “Set-based administration” on page 34, for “no-PC” programming of most of the system
- “Business Element Manager” on page 34, interface that supports all aspects of BCM50 2.0 element management
- “Network Configuration Manager (NCM)” on page 37, for multi-element support

## Ease of installation

BCM50 installation is simplified with innovative hardware and management tools.

The simple rack-and-stack nature of BCM50 physical installation, with the multipurpose RJ-45-based connector strategy, gives you ease of installation. The dedicated RJ-45 port for management access gives you easy access to the unit for on-site PC-based element management tasks.

For BCM50 installations that require data networking, IP sets, or VoIP trunking, BCM50 can function as a DHCP client to a network DHCP server for automated IP address assignment. BCM50 can also function as a DHCP server to provide both IP phone sets and a directly connected Element Manager PC with their IP configuration.

If you use set-based programming, you can install and program BCM50 telephony and applications through set-based administration. Installers who familiarize themselves with set-based programming use the keypad of any telephone connected to the system to program the system without requiring access to a PC.

All configuration can be performed using the “Business Element Manager” on page 34.

### Startup profile

To accelerate the initial installation programming of system-level parameters, you can use the Startup Profile to quickly bring the BCM50 to a basic operational state, ready to program, without having to use Element Manager or set-based administration.

The Startup Profile is an easy-to-use template you can datafill using Microsoft Excel. The Startup Profile gives you a quick interface for defining parameters such as:

- system profile including country, telephony template, and key voicemail attributes
- system IP parameters
- system-level telephony attributes to automatically create the system DNs

- keycode information through automated application of keycodes
- users and groups

You fill out the template, save it to a USB storage device, and insert the memory stick into the USB port of the BCM50 during the initial bootup of the system. This information is read into the BCM50 and applied through a single restart sequence.

The Startup Profile is similar to the Quickstart wizard of the BCM200 and BCM400, but it can be datafilled and applied without requiring an IP connection to the unit, a PC, or telephone set. It executes quickly, and includes a broad scope of system-level parameters.

## Remote management accessibility

BCM50 has an integrated analog modem that can accept an incoming modem call on any BCM50 system line. You can configure the BCM50 system to let the modem autoanswer a specific line with configuration options. Management can be from BRI. Remote users can also first initiate a voice call to a person or an autoattendant, who transfers the call to the modem.

The analog modem also supports callback for management access to the BCM50, which can be used to support autodialout on SNMP traps and automated sending of Call Detail Records (CDR) to a remote CDR collection point. The modem is also enhanced with CLID.

Although Nortel does not recommend that you use the analog modem for transferring large files, the modem gives you a flexible method of remote access to perform all programming tasks remotely.

The BCM50e and BCM50a give you remote management capability with a high-speed connection. Tasks such as transferring backup files to a remote destination and transferring software update files, CDR records, and log files, can be supported more efficiently than over the analog modem.

## On-box and device manageability features

BCM50 has an SNMPv3 interface that includes support for SNMP v1/v2 for management by legacy SNMP managers. SNMPv3 delivers improved security features for SNMP device access.

The BCM50 main unit supports the following versions of SNMP:

- SNMP v1 — the first implementation of SNMP; this version supports protocols such as IP
- SNMP v2C — provides improved efficiency and error handling
- SNMP v3 — provides improvements in security and privacy

Using the BCM50 Element Manager, you can select which versions of SNMP you want the BCM50 agent to support.

Management Information Bases (MIB) provide access to the managed objects of a system and specify the format of traps. BCM50 supports these standard MIBs for remote management:

- MIBII RFC 1213 — second version of the Management Information Base for use with network management protocols in a TCP/IP-based internet. It includes System Group and Interfaces Group and is a baseline RFC implemented by data-networking systems.

- Entity MIB RFC 2737 — describes managed objects used for managing multiple logical and physical entities managed by a single SNMP agent.
- System Host MIB RFC 2790 MIB for managing host systems — defines a set of objects common across many computer system architectures that are useful for the management of host computers, such as memory and CPU.
- SmallSiteEvent MIB for traps.
- RFC 2261 — SNMP Framework MIB.

BCM50 adopts the Common Information Model (CIM) standard according to the industry standards organization Distributed Management Task Force (DMTF), which provides a modeled method of managing system-programming parameters. BCM50 uses the transport mechanism CIM operations over HTTP using XML, also referred to as CIM-XML. The BCM50 CIM-XML interface provides a consistent way to manage data on the device, whether by the BCM50 Element Manager, NCM, or third-party network or service-management applications.

## Log management

BCM50 log management includes, in addition to the component logs that BCM200 and BCM400 systems provide, security logs, configuration change logs, alarm logs, and system logs.

## Set-based administration

BCM50 gives you the ability to use a telephone interface to program much of the BCM50 system. Set-based administration benefits include:

- BCM50 installations that do not have TCP/IP connectivity
- BCM50 installations where the installer does not have on-site access to a computer
- installers who prefer the speed of programming using set-based administration
- installers who are familiar with the Norstar interface

With set-based administration, you can manage:

- core telephony
- voicemail services
- IP network settings
- keycode entry
- admin password change
- modem on/off

Multiple languages are supported, consistent with Norstar set-based administration.

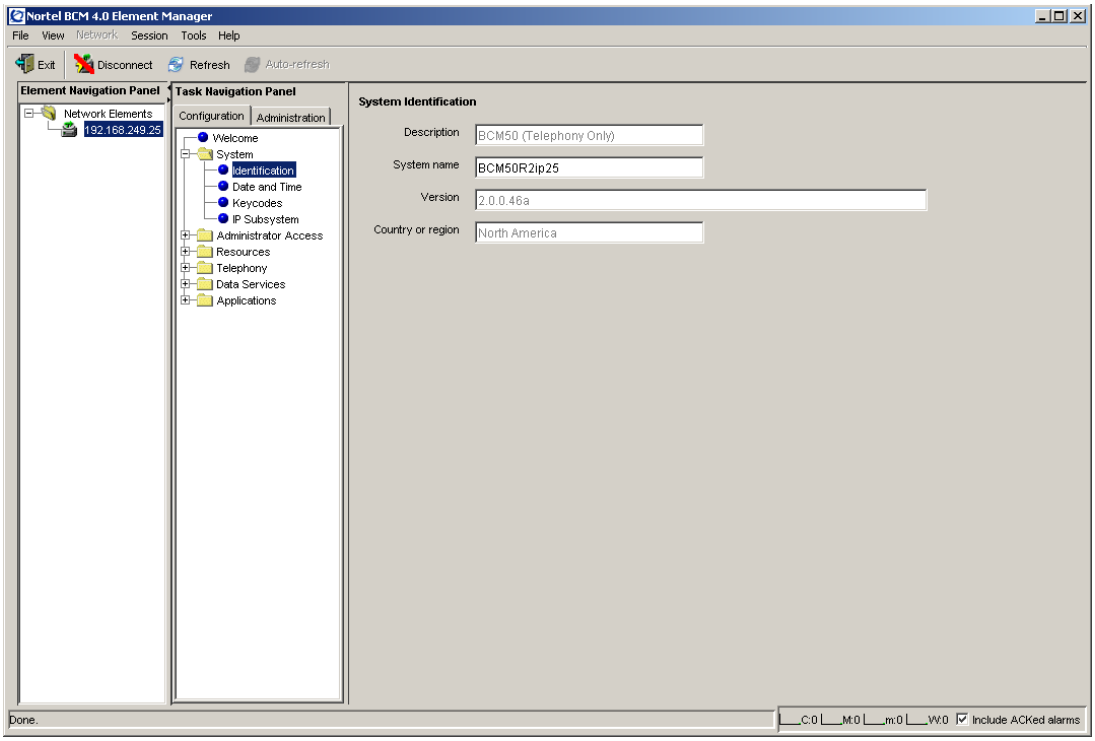
## Business Element Manager

Business Element Manager gives you access to BCM50 information in a new off-box management architecture. Element Manager has a task-based interface for ease of use.

If you use Business Communications Manager Unified Manager, you find that performing common BCM50 programming tasks is simpler, faster, and more information-rich with Element Manager, which requires minimal clicking through the interface to get to tasks. You can get to any programming screen in three or fewer mouse-clicks.

Programming data is enhanced in the Element Manager to quickly show all the associations between data in the form of tables. This eliminates looking in multiple places to get a system view of the programming.

**Figure 8** Business Element Manager interface




Element Manager runs on a PC, and the information required to draw the screens is contained locally within the client application. The only data transferred between Element Manager and the BCM50 are queries and actual data. Element Manager has familiar Microsoft Office-like capabilities, such as the ability to sort information.

All the traditional BCM administration tools including managing backups and software updates, are integrated into Element Manager.

Element Manager has an element navigation panel for organizing a network of elements. You can manage multiple elements at the same time. After you connect to an element, you can perform configuration and administration tasks.

## The Business Element Manager administration interface

The Element Manager administration management environment includes:

- BCM50 diagnostic and maintenance tools, including BCM Monitor.

- Fault management for viewing BCM50 alarms. You can set which alarms are displayed in the Element Manager alarm browser and which alarms trigger an SNMP trap.
- Log management for off-box transfer of logs, including component logs and administrator logs such as alarm log, security log, configuration change log, and system log.
- Software management tools for software updates (for example, for corrective software) and software upgrades.
- Backup and restore. You can schedule configuration backups or application backups. An application backup includes data generated through the day-to-day use of the on-box applications as well as the configuration data. A scheduled backup provides the ability to routinely perform a backup, which can be kept on the BCM50 hard drive or transferred to an off-box destination such as network folder, FTP server, or locally attached USB storage device.

For backup and restore, software management, and log management, a flexible set of source and destinations is supported along with protocols to access them. For example, you can save backups from the BCM50 to either the USB port, the Element Manager client PC (on-demand only), a shared drive available on the network, or a remote FTP server.

### Software updates

To ensure that BCM50 maintenance costs are low, even in an environment of security and corrective content updates, the BCM50 handles software updates as follows:

- You can download software updates to the BCM50, either on-demand or according to a schedule, from a USB port, a shared network drive, a remote FTP server, or a client PC.
- Update software is automatically checked against the BCM50 software history and validated before it is transferred.
- You can schedule the application of the software update separately. For example, you can schedule a download for Tuesday night, but the application can be scheduled for Friday at 2 a.m.
- You can program multiple software-update packages to be applied at the same time.
- One software-update package may include updates for multiple software components. While many software updates do not require a system reboot, some software components require a reboot for the update to take effect. No more than one system reboot is required if one or more of the software components being updated by the software-update package require a reboot.
- Software upgrades are handled in the same way and use the same tool as software updates.
- You can set up the entire software-update process for hands-off operation if the software content can either be downloaded remotely or sent out and installed from the USB port.

## Keycodes

The BCM keycode structure has been redesigned with these capabilities:

- One keycode validates all feature entitlements, which simplifies installation.
- You can apply keycodes in a number of ways:
  - through Element Manager

  - through set-based administration
  - through NCM
  - through a USB memory stick
- BRI enabled with keycode

### Network Configuration Manager (NCM)

Many Business Communications Manager customers already use the optional client-server based management application NCM to manage their multisite BCM200/400 network. Designed to provide a system-wide perspective for up to 2000 BCM devices, Network Configuration Manager is a centralized database that stores information about every Business Communications Manager device on your network.

NCM for BCM50 includes centralized backup and restore management, common file distribution (for example, system greeting files), parameter configuration, and automated software-update distribution. You can manage large BCM50 networks and mixed BCM50/200/400 networks using the NCM.

## BCM50 applications

BCM50 has a wide range of applications. You enable these applications through keycodes and do not require any additional hardware.

BCM50 gives you 10 ports for connecting to CallPilot and Contact Center. Each port supports one connection to that application. For example, four callers could be leaving voice messages, and two callers could be in the autoattendant while four callers are listening to voice messages. The number of ports can support a fully configured a BCM50 system with a full complement of voice mailboxes.

BCM50 comes with Mailbox Manager and CallPilot. Keycoded CallPilot options are also available, as are other BCM50 applications, such as LAN CTE, Personal Call Manager, and Call Detail Recording.

### Mailbox Manager

Mailbox Manager is a direct replacement for the BCM 3.x CallPilot Mailbox Manager. In particular, the following items can be administered through a browser:

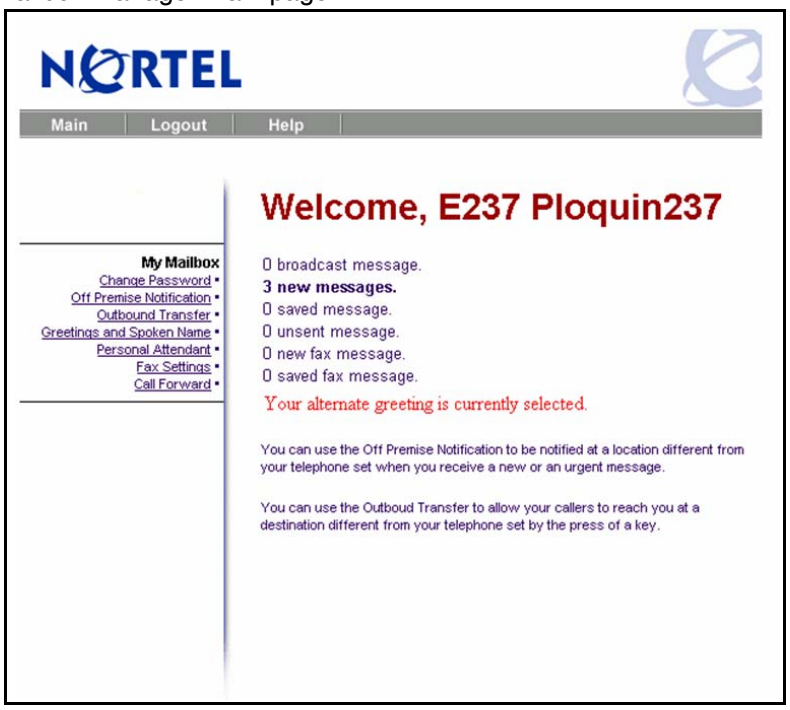
- Off Premise Notification settings
- Password
- Outbound transfer settings
- Spoken name (import, export, play and record)
- Primary, Alternate, and Personal Greetings (import, export, play, and record)
- Personal Attendant DN

- Fax settings (if fax messaging keycode is applied)
- Call forward to voicemail and display CLID

**Note:** These same items can be administered with F981. Also, only subscriber mailboxes, the general delivery mailbox, and the system administrator mailbox can be administered through the Mailbox Manager application at this time.

The main page shows your mailbox status information such as whether the phone set is forwarded, the mailbox is full, the number of broadcast messages, new messages and how many are urgent, saved messages, unsent messages (if the user is using the CallPilot user interface), new fax messages, and saved fax messages. A warning about an Off Premise Notification destination and the outbound transfer having failed is presented. If the alternate greeting is used, an indication of its use is presented along with an indication of whether messages are being accepted.

**Figure 9** Mailbox Manager main page


NORTEL
Main
Logout
Help
Welcome, E237 Ploquin237
My Mailbox
Change Password
Off Premise Notification
Outbound Transfer
Greetings and Spoken Name
Personal Attendant
Fax Settings
Call Forward
0 broadcast message.
3 new messages.
0 saved message.
0 unsent message.
0 new fax message.
0 saved fax message.
Your alternate greeting is currently selected.
You can use the Off Premise Notification to be notified at a location different from your telephone set when you receive a new or an urgent message.
You can use the Outboud Transfer to allow your callers to reach you at a destination different from your telephone set by the press of a key.

## Features included with Mailbox Manager

### *My Mailbox*

Information about the mailbox includes the number of each type of messages (if more then one message) and other information related to the state of the mailbox, including:

- The number of broadcast messages.
- The number of new messages. If one or more is urgent, this information is specified.
- The number of unsent messages.

- The number of saved messages.
- The number of new fax messages (if the fax keycode is applied).
- The number of saved fax messages (if the fax keycode is applied).
- Warning messages that appear in red if:
  - an extension is specified for the mailbox, but no telephone set is associated with the extension
  - the telephone is currently forwarded
  - an off-premise notification is not allowed
  - the outbound transfer is not allowed
  - the alternate greeting is selected
  - messages are not accepted
  - the mailbox is full

Also, My Mailbox displays useful messages to help you familiarize yourself with lesser-known features. For example,

- You can use the Off Premise Notification to be notified at a location different from your telephone set when you receive a new or an urgent message.
- You can use the Outbound Transfer to allow your callers to reach you at a destination different from your telephone set by the press of a key.

### *Off Premise Notification (OPN)*

OPN allows you to enter a destination that may be an extension, an external number or a pager number. You can turn notifications on or off, apply start and end times, and select a message type.

### *Outbound Transfer*

You can enter either an extension number as your outbound transfer destination or a telephone number to for outbound calling.

### *Greeting and Spoken Name*

You can use the greetings and spoken name page to record or re-record your spoken name, standard greetings (primary and alternate), and three personalized greetings. For each spoken name and greeting, a guide text informs you whether the corresponding is recorded.

### *Personal Attendant*

You can either select the system attendant as your personal attendant (default setting) or can enter a specific extension.

### *Fax Setting*

The Fax Setting page allows you to enter a preset destination where faxes can be printed. The destination can be either an extension or a telephone number, if outcalling is enabled. For users who do not have the outcalling capability, the Fax Setting page only allows for an extension to be entered.

### *Call Forward*

You can use the Call Forward page to forward your phone to voice mail. When the telephone is forwarded to Voicemail, you can view the callers being forwarded to your mailbox on the telephone screen. With this ability, you can select which calls you want to retrieve with F987.

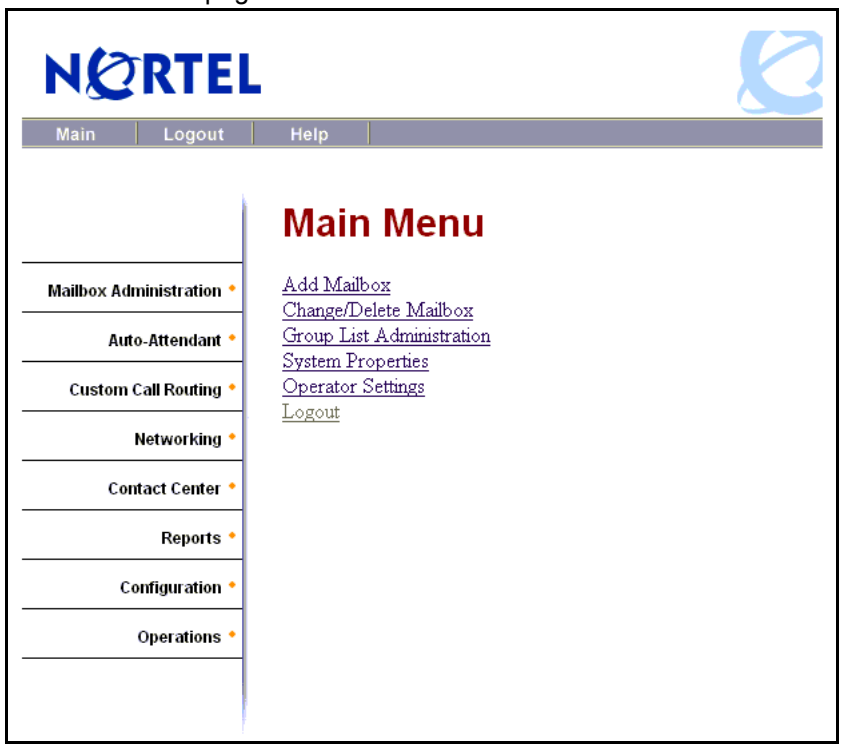
## CallPilot

BCM50 is a versatile business communications tool that you can use to:

- answer incoming calls
- offer callers a selection of options to route their calls or access information
- provide advanced voicemail, Auto Attendant and call handling capabilities

CallPilot Manager is a web-based application that is accessible through the BCM50 Element Manager. You use CallPilot Manager to set up and administer BCM50.

**Figure 10** CallPilot main page



### Features included with CallPilot

The following features are included with CallPilot for BCM50:

#### *Voicemail*

The Voicemail feature records messages and stores them in a mailbox for easy retrieval. Business telephones on your system can have their own mailbox and greeting. Information can be distributed quickly to departments and workgroups.

#### *Auto Attendant*

Auto Attendant is the CallPilot answering service that answers your business calls promptly, 24 hours a day, with a company greeting, plays a list of options to callers, and performs call-routing functions in response to caller selections.

#### *Custom Call Routing (CCR)*

Custom Call Routing enhances the Auto Attendant menu with customized menus and information messages. With CCR, you can determine the menu options and record the voice prompts that guide callers along call paths.

#### *Fax Answering*

Fax Answering lets outside callers send faxes to the main site telephone number. Fax Answering is available even if you do not have the Fax option installed on your system. With Fax Answering, a fax call that arrives through the Auto Attendant or CCR transfers to a specified extension.

## CallPilot options

CallPilot has options that enhance your office communications. You need a keycode to enable a CallPilot option. Contact your vendor if you want to purchase a software authorization code.

### Message networking

Message networking links your BCM50 system with other voice-mail systems and allows the exchange of voice messages between users at different sites. CallPilot supports Voice Profile for Internet Mail (VPIM) and Audio Messaging Interchange Specification (AMIS) networking.

For more information, see the *CallPilot Message Networking Set Up and Operation Guide*.

### Fax

Fax is a CallPilot option that enhances your office communications by providing incoming and outgoing fax capability (two ports only). With Fax, callers can send and retrieve fax messages as easily as they send and retrieve voice messages. The Fax option includes Fax Mail, Fax On Demand, and Fax Overflow. Fax Answering is available even if you do not have the Fax option installed on your system.

For more information about Fax, see the *CallPilot Fax Set Up and Operation Guide*.

### Unified messaging

With Unified messaging, you can use their e-mail application to access voice, fax, and text messages from their personal computer. You can use Unified Messaging with several popular e-mail application, including:

- Microsoft Outlook 2000, Outlook 2002 (XP), Outlook 2003 including Internet Mail Mode
- Lotus Notes - 5.x and 6.x
- GroupWise - 6.x
- Microsoft Outlook Express - 5.x and 6.x
- Netscape Messenger (Netscape Communicator) - 6.2x
- Netscape Mail - 7.0x
- Qualcomm Eudora Pro - 6.1.2

For more information, see the *Unified Messaging Configuration Guide*.

## CallPilot/Voicemail Enhancements

BCM50 builds upon the existing set of CallPilot/Voicemail capabilities through the introduction of a set of feature enhancements on the BCM CallPilot offering.

These features enhancements include the following.

- significant increases in number of greeting tables, company greetings, and Custom Call Routing (CCR) trees
  - — This increase provides the flexibility to use a different Auto Attendant/CCR for different incoming lines.
- F983 Class Of Service Administration
  - — This enhancement expands set-base administration to include programming of Class of Service
- prevention of trivial mailbox passwords
  - — This security enhancement prevent Trivial passwords (for example, 1111 or 1234) when enabled.
- up to five alternate DNs per mailbox with Message Waiting Indicator on six sets
  - — Previously, up to two alternative DNs per mailbox/MWI on three sets was supported
- Mailbox assignable feature restrictions
  - — This enhancement allows the administrator to limit features for selected mailboxes in the system. This feature is especially applicable for retail and hospitality industries.
- Unified Messaging R2.5 support of Citrix
  - — Unified messaging 2.5 is now supported in a Citrix environment.
- ability to receive VPIM broadcast messages from M1 CallPilot
  - — The system can rebroadcast a network message from M1 without additional programming.

- additional voice mail prompt languages including, Polish, Irish English, Finnish, Korean and Turkish

## Contact Center

Contact Center (CC) is an evolution of the existing Call Center capability on BCM. Contact Center has the same functionality as the current Professional Call Center with the ability to choose exactly the number of agents and skillsets that a customer or customer site requires. This provides the following values with CC:

- Provides maximum flexibility in granularity.
- Any combination of Agents and Skillsets within boundaries of platform. This combination eliminates any confusion of features between Basic and Professional. Channel partners and customers do not have to worry about what functionality is contained with what product.
  - Contact Center with Professional Contact Center level of functionality.
- Simplifies product offering
  - Contact Center, x Skillsets, x Agents, RCC
  - Eliminates Basic, Pro, and upgrade between the two
- Increases market potential.
  - Customers that require more Skillsets than agents

    Example: Real Estate — 3 receptionists (3 agents) answering for 20 real estate agents (20 skillsets)
  - Big-box retail — 3 receptionists (3 agents) answering for 12 departments (12 skillsets).

Optional components include:

- x Agents (keycodes offer granular selection of the number of desired agents)
- x Skillsets (keycodes offer granular selection of the number of desired skillsets)
- Reporting for CC
- Multimedia CC

For more information, see the *Contact Center Set Up and Operation Guide*.

## Multimedia Contact Center

Using the Multimedia Contact Center application, agents and callers can participate in multimedia calls that include:

- speaking over a Public Switched Telephone Network (PSTN) voice connection
- text chatting
- exchanging and viewing Web pages
- viewing screen captures (sent by an agent to the caller)

Multimedia Contact Center supports two call types:

- Phone-and-browser calls (using PSTN), which integrate a standard voice call with a Contact Center agent and a Multimedia Contact Center browser call session with follow-me browsing, text chat, and screen-capture push.
- Browser-only calls, which have the same browser features of phone-and-browser calls but no voice call component.

## Local Area Network Computer Telephony Engine

BCM Computer Telephony Integration (CTI) products provide an interface between your personal computer and your BCM50 system. With these products, you can use telephony applications through the Windows operating system to control your telephone.

One of the software components of BCM CTI is Local Area Network Computer Telephony Engine (LAN CTE). LAN CTE provides an interface between your personal computer, your telephone, and the BCM50 system. With LAN CTE installed on your computer, you can run LAN CTE or TAPI applications to communicate with and control your telephone.

For more information, see the *LAN CTE Configuration Guide*.

## Call Detail Recording

Call Detail Recording (CDR) is an application that collects call activity. Each time a telephone call is made to or from your company, CDR can record the information about the call. You can use the information CDR collects to create reports about call activity. CDR also provides an interface to third-party applications to allow for call accounting and billing.

For more information, see the *Call Detail Recording System Administration Guide*.

## Personal call manager

Personal Call Manager is a TAPI-based application that provides an easy-to-use interface between your computer and your telephone. You use the telephone to speak with a caller. You can customize your Address Book and your calls. Basic functions that Personal Call Manager performs include making and answering calls, putting calls on hold, transferring calls, and making conference calls.

For more information, see the *Personal Call Manager User Guide*.

# BCM compatibility matrix

The following table indicates the compatibility of components and features through the BCM product line.

| Component/ Feature | BCM 3.6 | BCM 3.7 | BCM50 1.0 | BCM50e 1.0 | BCM50a 1.0 | BCM 4.0 | BCM50b 2.0 | BCM50a/ba 2.0 | BCM50e/be 2.0 |
|---|---|---|---|---|---|---|---|---|---|
| **Operating System** | | | | | | | | | |
| Windows NT 4 Embedded | Yes | Yes | No | No | No | No | No | No | No |
| Nortel Carrier Grade Linux | No | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Hardware** | | | | | | | | | |
| Digital Terminals | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| T7000 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| T7100 & M7100 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| T7208 & M7208 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| T7316 & M7324 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| T7406 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| T24 KIM & CAP | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Norstar Audio Conference Unit | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Doorphone | Yes | Yes | No | No | No | Yes | Yes | Yes | Yes |
| IP Terminals | | | | | | | | | |
| IP Phone 2001 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| IP Phone 2002 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| IP Phone 2004 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| IP Key Expansion Module 24 | No | No | No | No | No | Yes | Yes | Yes | Yes |

| Component/ Feature | BCM 3.6 | BCM 3.7 | BCM50 1.0 | BCM50e 1.0 | BCM50a 1.0 | BCM 4.0 | BCM50b 2.0 | BCM50a/ba 2.0 | BCM50e/be 2.0 |
|---|---|---|---|---|---|---|---|---|---|
| i2050 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| IP Softphone 2050 | No | No | No | No | No | No | Yes | Yes | Yes |
| IP Phone 2007 | No | Yes | No | No | No | Yes | Yes | Yes | Yes |
| IP Phone 1120e | No | No | No | No | No | Yes | Yes | Yes | Yes |
| IP Phone 1140e | No | No | No | No | No | Yes | Yes | Yes | Yes |
| IP Audio Conference Phone 2033 | No | No | No | No | No | Yes | Yes | Yes | Yes |
| WLAN IP 2210 | Yes - with patch | Yes | No | No | No | Yes | Yes | Yes | Yes |
| WLAN IP 2211 | Yes - with patch | Yes | No | No | No | Yes | Yes | Yes | Yes |
| WLAN IP 2212 | No | No | No | No | No | Yes | Yes | Yes | Yes |
| MCS Card | MSC1A/ MSC1B | | Integrated CSC | | | Yes | Yes | Yes | Yes |
| Expansion unit | 1 Exp with 6 MBMs | | 2 Exp with 1 MBM | | | 1 Exp with 6 MBMs | 2 Exp with 1 MBM | | |
| **Applications** | | | | | | | | | |
| Integrated IVR | Yes | Yes | No | No | No | Yes | No | No | No |
| IP Sets | 89 | 89 | 32 | 32 | 32 | 64 | 32 | 32 | 32 |
| IP Trunks | 60 | 60 | 10 | 10 | 10 | 60 | 10 | 10 | 10 |
| H.323 with MCDN | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| SIP | Yes | Yes | No | No | No | Yes | Yes | Yes | Yes |
| SIP with MCDN | No | No | No | No | No | Yes | Yes | Yes | Yes |
| SRG | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Voice Mail ports | 32 | 32 | 10 | 10 | 10 | 32 | 10 | 10 | 10 |
| IP Music | Yes | Yes | No | No | No | Yes | Yes | Yes | Yes |
| Fax ports | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

| **Component/ Feature** | **BCM 3.6** | **BCM 3.7** | **BCM50 1.0** | **BCM50e 1.0** | **BCM50a 1.0** | **BCM 4.0** | **BCM50b 2.0** | **BCM50a/ba 2.0** | **BCM50e/be 2.0** |
|---|---|---|---|---|---|---|---|---|---|
| IP Trunks Codecs | 711-729-723 | | 711-729 | | | | | | |
| **Management** | | | | | | | | | |
| NCM | Yes - NCM 3.6 | | | | | | | | |
| NetIQ support | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Unified Manager | Yes | Yes | No | No | No | No | No | No | No |
| System Set Based Admin (F9*8) | No | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Element Manager | No | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Set Based Admin | | | | | | | | | |
| Telephony | No | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| CallPilot | No | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| PVQM | No | No | No | No | No | Yes | Yes | Yes | Yes |
| **Applications** | | | | | | | | | |
| LAN CTE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| CDR | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Mailbox Manager | Yes | Yes | No | No | No | Yes | Yes | Yes | Yes |
| Operator MB Manager | Yes | Yes | No | No | No | Yes | Yes | Yes | Yes |
| Contact Center | | | | | | | | | |
| Basic Contact Center | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Professional Contact Center | Yes | Yes | No | No | No | No | No | No | No |
| Reporting for Contact Center | Yes | Yes | No | No | No | Yes | Yes | Yes | Yes |
| Multimedia Contact Center | Yes | Yes | No | No | No | Yes | Yes | Yes | Yes |
| UPS support | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Backup and Restore | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

| Component/ Feature | BCM 3.6 | BCM 3.7 | BCM50 1.0 | BCM50e 1.0 | BCM50a 1.0 | BCM 4.0 | BCM50b 2.0 | BCM50a/ba 2.0 | BCM50e/be 2.0 |
|---|---|---|---|---|---|---|---|---|---|
| Upgrade from previous version | From 3.0, 3.01 & 3.5 | From 3.5 & 3.6 | Not available | | | Yes | Yes | Yes | Yes |
| BCM Imaging Tool | Yes | Yes | No | No | No | Yes | No | No | No |
| Level 1 & 2 Reset | No | No | Yes | Yes | Yes | No | Yes | Yes | Yes |
| **Wireless** | | | | | | | | | |
| T7406 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 802.11b WVoIP i22xx | Yes - with patch | Yes | No | No | No | Yes | Yes | Yes | Yes |
| Digital Mobility | No | Yes | No | No | No | Yes | Yes | Yes | Yes |
| **Data Services** | | | | | | | | | |
| Firewall | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes |
| ISDN Dial-up | Yes | Yes | No | No | No | Yes | Yes | Yes | Yes |
| ADSL | | | | | | | | | |
| Client | PPPoE | | No | Yes | Yes | Yes | Yes | Yes | Yes |
| Integrated ADSL Modem | No | No | No | Yes | No | No | No | Yes | No |
| VPN | | | | | | | | | |
| IPSec Client | Terminating | | No | Terminating out | | Yes | Yes | Yes | Yes |
| IPSec Branch | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes |
| PPTP | Yes | Yes | No | No | No | No | No | No | Yes |
| DHCP Client | No | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| DHCP Server | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| DHCP Relay | No | No | No | No | No | Yes | Yes | Yes | Yes |
| NAT | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes |
| Routing Protocols | RIP, OSPF & Static | | No | RIP & Static | | Yes | Yes | Yes | Yes |
| QoS | Yes | Yes | No | No | No | Yes | Yes | Yes | Yes |
| Dial Back-up | Yes | Yes | No | No | No | Yes | No | Yes | Yes |
| SNMP | ver. 1 | ver. 1 | ver.1,2 and 3 | | | | ver.1,2 and 3 | | |

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